

# Work Order ID 124886

**\*124886\***

Thursday, September 25, 2014 1:08:39 PM

Page 1

Item ID: D407-667-105RLC Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Fwd Crosstube - High 407  
 Start Date: 9/25/2014 Start Qty: 1.00 **\*1\*** Cust Item ID:  
 Required Date: 9/25/2014 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan: MUS Date: 14-09-25 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D407-667-145	Rev C (DEO)								
DSI9565	A								
DSI9628	A								
100	Document Control	0.00							
<b>*100*</b>	DOCUMENT CONTROL								
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile and create labels as per PPP D407-667-105 CHG005								
110	Packaging	0.00							
<b>*110*</b>	Packaging								
Packaging	Memo	0.00							
Packaging									

OCT 22 2014

DAC  
C6  
8-83

14 MUS 14-10-21

14-09-29

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Item ID: D407-667-105RLC

Accept

**\*N19000040100\***Setup Start **\*NS1\***

Revision ID:

Item Name: Fwd Crosstube - High 407

Stop **\*NS2\***

Start Date: 9/25/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120	BENDING MACHINE - CROSSTUBES	0.00							
<b>*120*</b>									
CNC Bend 2	Memo	0.00							
CNC Alpha 160 Bender	Bend tube as per Dwg D407-667-145 using CNC bender program 407-fw								
130	QC15- Crosstube Dimensional Check	0.00							
<b>*130*</b>									
QC	Memo	0.00							
Quality Control									

DAS  
03  
9-29

JW 14-09-30

DP 14-10-1

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Item ID: D407-667-105RLC

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Item Name: Fwd Crosstube - High 407

Stop

**\*NS2\***

Start Date: 9/25/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

**\*NR1\***

Stop

**\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	Crosstubes	0.00							
<b>*140*</b>									
Crosstubes									
Crosstubes	<b>Memo</b>	0.00							
	***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING***** , VERIFIED BY: <u>                    </u> *****								
	1- Drill holes & ream using drill Jig DT8541 & DT8542 as per Dwg D407-667-145. Drill all (3) top holes. Holes facing inboard.								
	***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING***** , VERIFIED BY: <u>                    </u> *****								
	2- Drill Fwd rivet holes using drill Jig DT8787 fwd as per Dwg D407-667-145. Note: Fwd side has 3x top holes. Facing inboard.								
	3- C'sink holes as per Dwg D407-667-145. Allow rivet to sit below surface to compensate for paint.								
	4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom holes to prevent accidental drilling.								
	***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING***** , VERIFIED BY: <u>                    </u> *****								
	5- Drill holes and ream using drill Jig DT8541 & DT8542 as per Dwg D407-667-145. Drill only the top (2) holes.								
	***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING***** , VERIFIED BY: <u>                    </u> *****								

RLJ / DAS 46 1410-01  
9-89

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Item ID: D407-667-105RLC

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***  
Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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6- Drill Aft rivet holes using drill Jig DT8787 aft as per Dwg D407-667-145.

7- C'sink holes as per Dwg D407-667-145. Allow rivet to sit below surface to compensate for paint.

8- Scribe part # and batch # using vibrating stylus as per Dwg D407-667-145  
Inside of Cuff (Do not engrave on outside of tube)9- \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* Deburr  
& Inspect for surface damage. Repair damage within limits as per Dwg D407-667-145DAS  
**46**  
9-89

14/10/02

150

QC5- Inspect part completeness to step on W/O 0.00

**\*150\***

QC

Memo 0.00

Quality Control

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1 6 14/10/02  
DAS  
**38**  
9-89  
DAS  
**49**  
9-89

160

0.00

**\*160\***

HandFXtube

Memo 0.00

Hand Finishing Crosstubes

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1 14-10-06  
DAS  
**41**  
9-89

1-CLEAN CROSSTUBE WITH WASH'N WIPE

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 Required Date: 9/25/2014 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

180

Outsource process - NDT per QSI038 4.1

0.00

**\*180\***

Outsource2

**Memo**

0.00

Outsource process - NDT

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

OUTSIDE SERVICE -CROSSTUBES

Liquid Penetrant Inspection as per QSI 038 Or

Issue P/O: 26038 LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

CL 14/10/07 ①

1x SP 14-10-8

190

0.00

**\*190\***

Packaging

Packaging

**Memo**

0.00

Packaging

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

Inspect for transit damage

Ensure copy of NDT results attached to work order.

200

QC5- Inspect part completeness to step on W/O

0.00

**\*200\***

QC

**Memo**

0.00

Quality Control

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

Inspect for damage & ensure results are as per Dwg D206-667-145

DAS

38

9-89

14-10-8

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Item ID: D407-667-105RLC

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

204

0.00

**\*204\***

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN  
CROSSTUBE BEFORE CHEMICAL CONVERSION

13L 14-10-08

206

QC7-Inspect Chemical Conversion Coat

0.00

**\*206\***

QC

Memo

0.00

Quality Control

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

DAS  
38  
9-89

1 14-10-08

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Item ID: D407-667-105RLC

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

**\*210\***

SprayPaint

Spray Painting

SprayPaint

Memo

0.00

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

\*\*\*MASK AREA RPIOR TO PAINTING AS PER DWG AND DEO\*\*\*

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME BATCH:

Start Time: 11:00

Fininsh Time: 11:30

PAINT BATCH:

Start Time: 4:00

Finish Time: 4:30

30128

179977

1 CL1410-08

220

**\*220\***

QC

Quality Control

QC14- Inspect Spray Paint

0.00

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

1 14-10-20

DAS  
51  
9-89  
DAS  
38  
9-89  
14-10-20

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Item ID: D407-667-105RLC

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Item Name: Fwd Crosstube - High 407

Stop **\*NS2\***

Start Date: 9/25/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

**\*230\***

Crosstubes

Crosstubes

0.00

Memo

0.00

Crosstubes

INSTALL GROUNDING CLAMP AND SEAL WITH SIKAFLEX AS PER  
DWG AND DEOA/R SIKAFLEX BATCH: 130227  
exp 2/151-Abrade mating surfaces of support and crosstube with 180 grit sandpaper,  
clean the area with MEK or equivalent as per dwg

2-Install supports with Proseal 890 per D407-667-145 (DEO) and QSI 015

A/R Proseal 890 Batch: 130096  
EXP: 4/153-Install supports clamps Using Dt9565 as per Dwg D407-667-145  
(DEO), Torque to 80-100 IN-LBS.

PROSEAL CURE TIME 72 HOURS:

Start: 14.10.16Finish: 14.10.194-Install nut plates as per Dwg D407-667-145. Touch-up rivet heads with Imron  
paint.1 OR 14.10.16



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Item ID: D407-667-105RLC

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Stop

**\*NS2\***

Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 9/25/2014 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

**\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop

**\*NR2\***

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

DAS

240

QC5- Inspect part completeness to step on W/O

0.00

**\*240\***

QC

Memo

0.00

Quality Control

\*\*\*RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED  
FOR 72HOURS AS PER DWG.\*\*\*

\*\*\*VERIFY RESISTANCE AS PER NOTE 18 AND DWG DEO\*\*\*

DAS  
51  
9-89  
14-10-20

250

Pick Kit

0.00

**\*250\***

Packaging

Memo

0.00

Packaging

DAS  
28  
9-89

OCT 2 1 2014

260

QC4- 100% Inspect kits for completeness

0.00

**\*260\***

QC

Memo

0.00

Quality Control

DAS  
06  
9-89

OCT 2 2 2014

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Item ID: D407-667-105RLC Accept **\*N19000040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Fwd Crosstube - High 407  
 Start Date: 9/25/2014 Start Qty: 1.00 **\*1\*** Cust Item ID:  
 Required Date: 9/25/2014 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270	Packaging	0.00							
<b>*270*</b>									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D407-667-105								
	Location: _____								
	PPP Rev: _____								
280	QC21- Final Inspection - Work Order Release	0.00							
<b>*280*</b>									
QC	Memo	0.00							
Quality Control									

OCT 27 2014

DAS  
CS  
SAS

MSA

Ship off

14/10/28

4-10-28

# Picklist Print

Thursday, September 25, 2014 1:08:42 PM

Page 1

Work Order ID: 124886

**\*124886\***

Parent Item: D407-667-105RLC

**\*D407-667-105RI C\***

Parent Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014

Required Date: 9/25/2014

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A 14.09.24 NEW ISSUE II VERF:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D206-667-017

Manufactured No

Each 9.0000

1

DAS  
41  
9-89

**\*D206-667-017\***

Ground Strap Installation

\*\*

14-10-18

Location

Loc Qty

Loc Code

FG

2

102581

2

LG050

7

107968

5

97504

2

AN5-32A

Purchased No

250 Each

271.0000

4

4

DAS  
28  
9-89 OCT 2 1 2014

**\*AN5-32A\***

Bolt

DAS  
03  
9-89

\*\*

Location

Loc Qty

Loc Code

ST336

271

124215

80

m127363

4

m128403

66

m128634

121

D407-667-105TRN

Manufactured No

110 Each

5.0000

1

1

**\*D407-667-105TRN\***

Crosstube Turning Detail

\*\*

Location

Loc Qty

Loc Code

LG014

5

116476

1

120868

1

120869

1

120870

1

120871

1

①

14-09-29

# Picklist Print

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Work Order ID: 124886

**\*124886\***

Parent Item: D407-667-105RLC

**\*D407-667-105RLC\***

Parent Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014

Required Date: 9/25/2014

Start Qty: 1.00

Required Qty: 1.00

D2873-043

Manufactured No

230

Each

44.0000

2

2

**\*D2873-043\***

Nut Plate Assembly

**\*\***

CR 14.10.08

Location

Loc Qty

Loc Code

LG052

44

107964

4

~~113050~~

32

114550

8

D2873-045

Manufactured No

230

Each

47.0000

2

2

**\*D2873-045\***

Nut Plate Assembly

**\*\***

CR 14.10.08

Location

Loc Qty

Loc Code

LG052

47

113144

7

~~113886~~

40

D2891-1

Manufactured No

230

Each

34.0000

2

2

**\*D2891-1\***

Support 2.25

**\*\***

DAS  
41  
989

~~14.10.10~~

Location

Loc Qty

Loc Code

FG

2

84164

2

LG014

22

113044

1

~~114948~~

21

LG052

10

120972

10

CR 14.10.12

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Work Order ID: 124886

**\*124886\***

Parent Item: D407-667-105RLC

**\*D407-667-105RI C\***

Parent Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014

Required Date: 9/25/2014

Start Qty: 1.00

Required Qty: 1.00

D3595-063-395

Manufactured No

230

Each

217.0000

4

4

**\*D3595-063-395\***

Rubber Cushion

**\*\***

~~DAS~~  
~~41~~  
~~9.89~~  
~~17.10.10~~

CR 14.10.12

Location

Loc Qty

Loc Code

FG	5	
87353	5	
LG051	212	
110958	6	
114243	6	
115027	100	
<u>115737</u>	100	

_____
_____
_____
_____
_____
_____
4

MS21920-20

Purchased No

Each

223.0000

4

**\*MS21920-20\***

Clamp

**\*\***

~~DAS~~  
~~41~~  
~~9.89~~  
~~17.10.10~~

CR 14.10.12

Location

Loc Qty

Loc Code

FG	2	
122254	2	
LG050	221	
m126266	1	
m127225	4	
m128429	1	
<u>m128650</u>	215	

_____
_____
_____
_____
_____
_____
4

# Picklist Print

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Work Order ID: 124886

**\*124886\***

Parent Item: D407-667-105RLC

**\*D407-667-105RI C\***

Parent Item Name: Fwd Crosstube - High 407

Start Date: 9/25/2014

Required Date: 9/25/2014

Start Qty: 1.00

Required Qty: 1.00

MS20601-AD4W10

Purchased

No

230

Each

507.0000

14

14

**\*MS20601-AD4W10\***

**\*\***

*CR 14.10.08*

RIVET

Location

Loc Qty

Loc Code

LG050

432

M127301

30

M127578

2

M128594

100

M128701

300

LG051

75

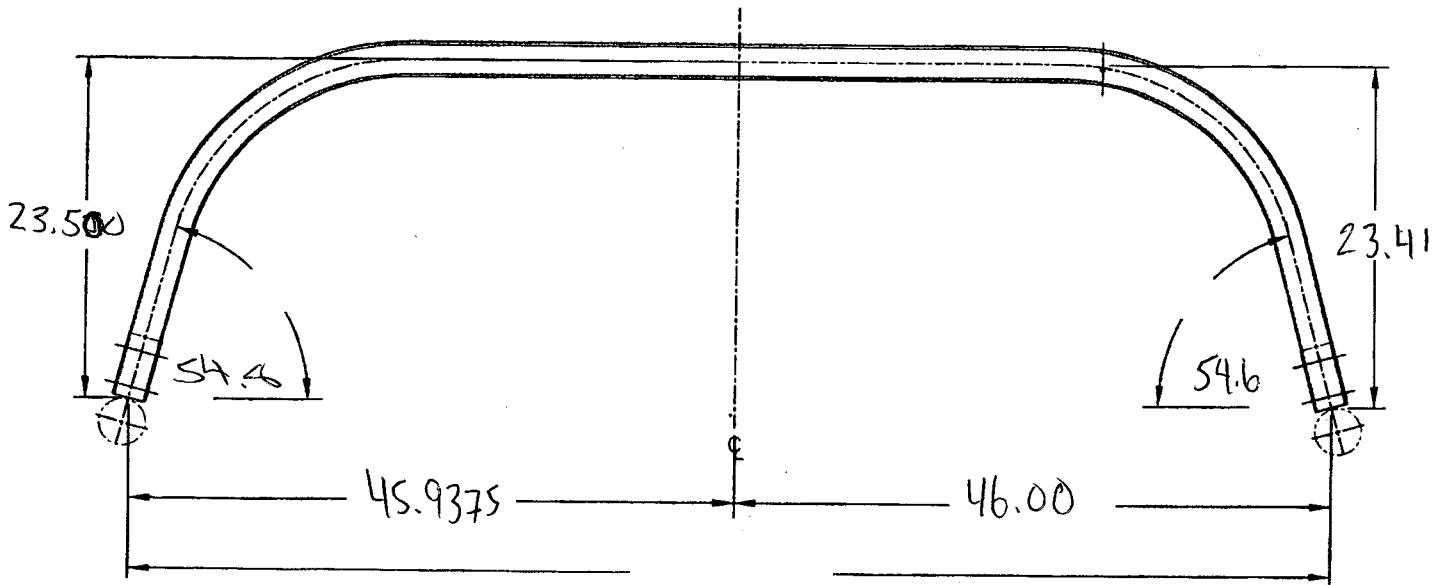
M128718

75

*14*

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 124886
<b>Description:</b> Crosstube High Fwd (407)		<b>Part Number:</b> D407-667-105
<b>Inspection Dwg:</b> D407-667-145 <b>Rev:</b> C		<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	23.41	23.67
1/2 Span	45.81	46.07
Angle	54	56
Total Span	91.62	92.14
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	13	12
Crushing	4.8%	5.2%
Comments		

QC15 Inspection	DAS 03
Date	14-10-1

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.11.12	Dimensions updated per Dwg Rev C	KJ	
C	12.04.16	Added bending, crushing dimensions	KJ	
D	12.10.30	Revised Total Span dimensions & Dwg Rev	KJ	

Item	Qty -145	Part Number	Description
1	X	D407-667-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
2	1	D6010-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6010-115  
FINISHED LENGTH = 113.20±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-145" AND BATCH NUMBER ON  
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 17.8 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,  
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE  
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER  
QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE  
THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS  
ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS  
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT  
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN  
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 124886 MLJ  
1409-25

DEO ATTACHED

ECW #11-615  
11.07.26

UNDER REVIEW

RELEASED  
08/11/12

C	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-395 WAS D2856-400-694 (ZN D6-2 & A5-2); REMOVED REF. 7 ADD TOLERANCES (ZN C6-3, C4-3, D2-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
A	NEW ISSUE	CP	02.05.08
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO. D407-667-145	REV. C SHEET 1 OF 4
CHECKED	RF	TITLE CROSSTUBE ASS'Y (407 HIGH FWD)	SCALE NTS
MFG. APPR.	RF	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	
APPROVED	RF	DATE 08.11.06	
DE APPR.	RF		



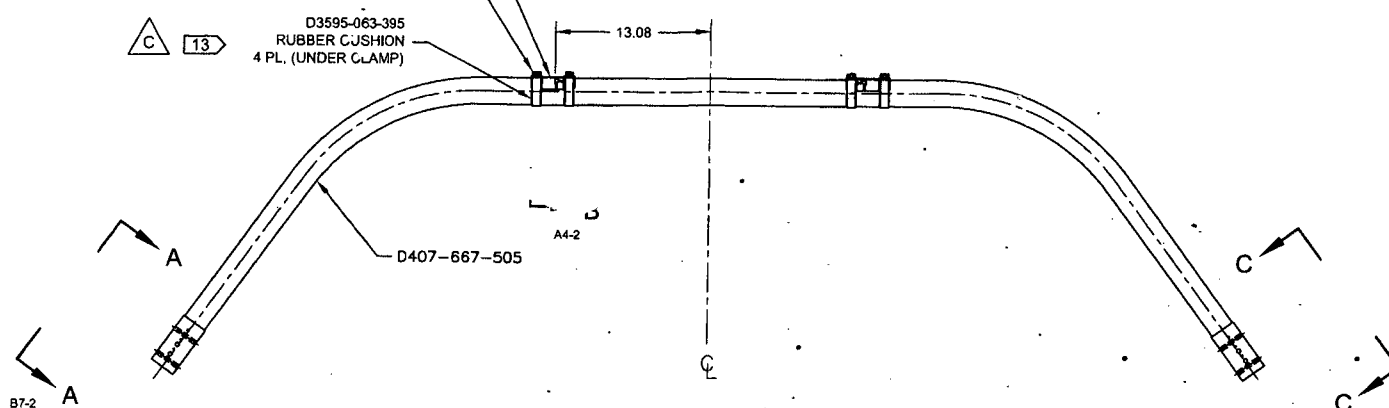
8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

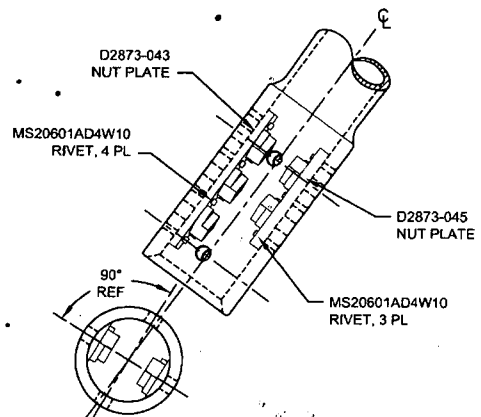
12 D2891-1 SUPPORT  
2 PL

15 MS21920-20 CLAMP  
4 PL

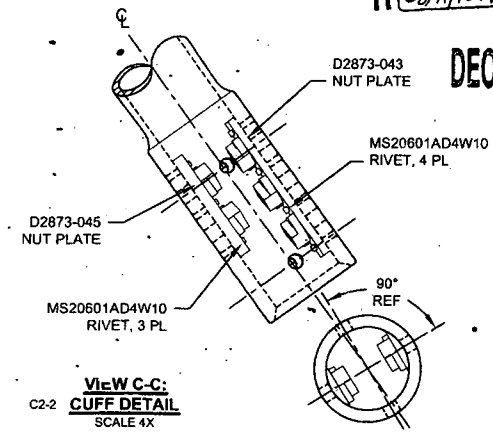
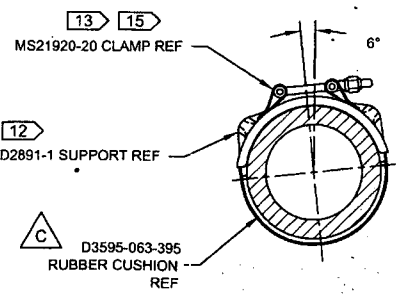
13 D3595-063-395  
RUBBER CUSHION  
4 PL, (UNDER CLAMP)



**D407-667-145**  
**ASSEMBLY DETAIL**  
(VIEW LOOKING FWD)



**VIE 7A-A:**  
**CUFF DETAIL**  
SCALE 4X



**VIE W C-C:**  
**CUFF DETAIL**  
SCALE 4X

600 H. 615  
11.07.28  
**UNDER REVIEW**  
9/1/06-13

**RELEASE**  
08/11/2008

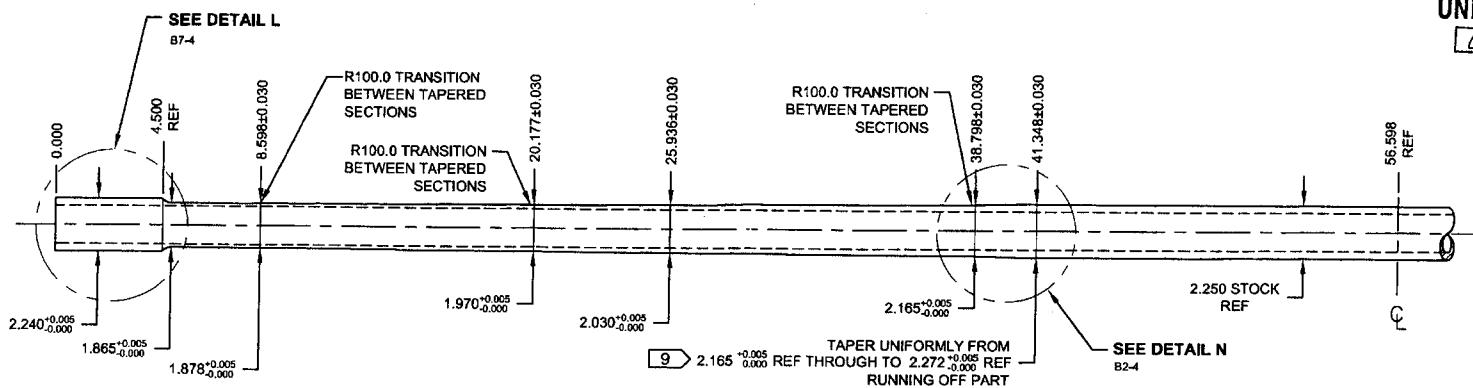
**DEO ATTACHED**

DESIGN	40	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	40	DRAWING NO.	REV. C
MFG. APPR.	40	D407-667-145	SHEET 2 OF 4
APPROVED	40	TITLE	SCALE
DE APPR.	40	CROSSTUBE ASS'Y (407 HIGH FWD)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
		THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

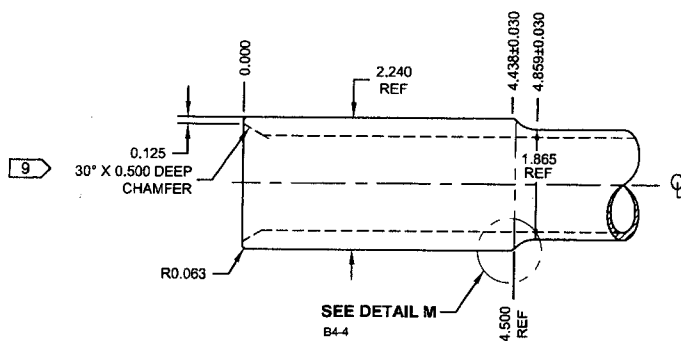


**UNDER REVIEW**

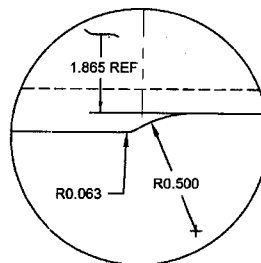
CP 11.08.13  
baw 11.615  
11.07.26



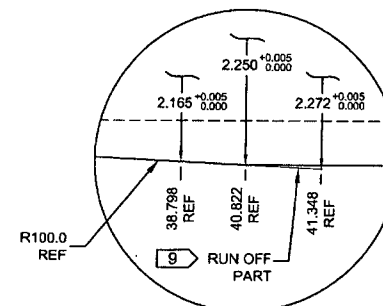
**TURNING DETAIL**



**DETAIL L:  
CROSSTUBE CUFF**  
D7-4  
NOT TO SCALE



**DETAIL M:  
CUFF TRANSITION**  
D6-4  
NOT TO SCALE



**DETAIL N:  
TAPER RUN-OFF**  
C3-4  
NOT TO SCALE

**DEO ATTACHED**

**RELEASED**  
08/11/2006

DESIGN	9	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	CP	DRAWING NO. D407-667-145	REV. C SHEET 4 OF 4
MFG. APPR.	CP	TITLE	SCALE
APPROVED	CP	CROSSTUBE ASS'Y (407 HIGH FWD)	NTS
DE APPR.	CP	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
DATE	08.11.06	THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DRAWING NO. D407-667-145	TITLE CROSSTUBE ASS'Y (407 HIGH FWD)	REV. C	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-145-C-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN QP	CHECKED ASS	MFG. APPR. IB	APPROVED WD		DE APPR. H		
DATE 11.07.15	DATE 11.07.22	DATE 11.07.22	DATE 11/07/22		DATE 11.07.21		

**PURPOSE:**

REPLACE MAGNOBOND WITH PROSEAL.

**CHANGE:**

IS:

Item	Qty -145	Part Number	Description
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2891-1 SUPPORT: ABRAD MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

**RELEASED**  
2011-07-28  
WD

DRAWING NO. D407-667-145	TITLE CROSSTUBE ASS'Y (407 HIGH FWD)	REV. C	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-145-C-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN AJG	CHECKED [Signature]	MFG. APPR. [Signature]	APPROVED [Signature]		DE APPR. [Signature]		
DATE 12.08.02	DATE 12.08.02	DATE 12.08.02	DATE 12.08.02		DATE 12.08.02		

**PURPOSE:**

ADD ELECTRICAL GROUNDING STRAP

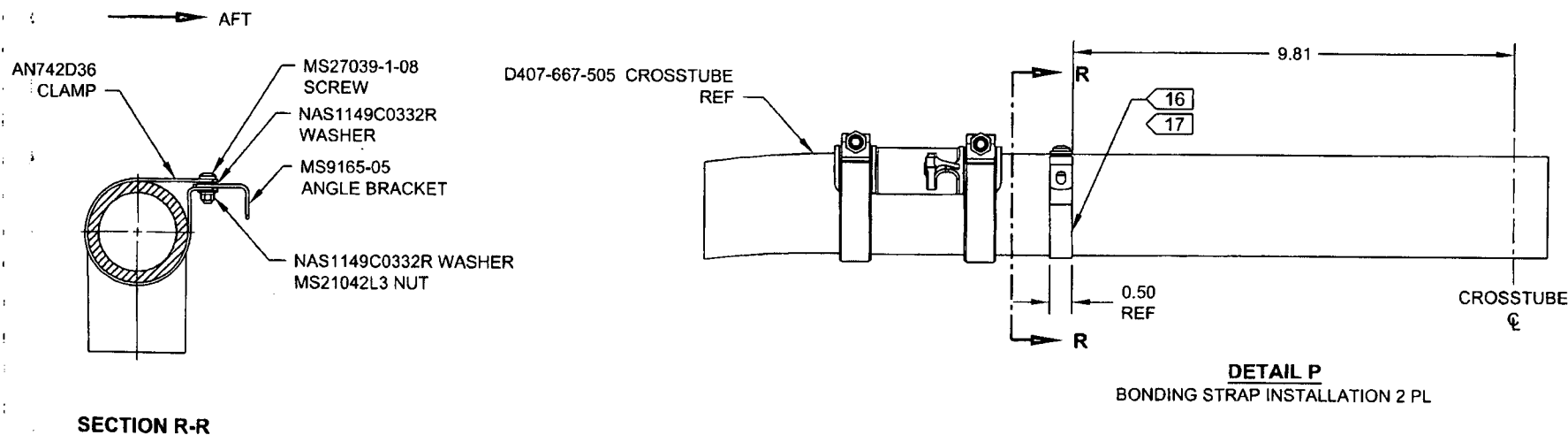
**CHANGE:**

ITEM	QTY -145	PART NUMBER	DESCRIPTION
1	X	D407-667-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
⚡			
10	2	AN742D36	CLAMP
11	2	MS9165-05	ANGLE BRACKET
12	2	MS21042L3	NUT (OR MS21042-3)
13	2	MS27039-1-08	SCREW
14	4	NAS1149C0332R	WASHER (OR AN960C10L)

**GENERAL NOTES:**

- 16) MASK AREA UNDER CLAMP PRIOR TO PAINTING
- 17) SEAL EDGES WHERE AN742D36 CLAMP MEETS WITH THE CROSSTUBE USING SIKAFLEX-241/-291 OR MIL-S-8802 CLASS B2 OR PROSEAL 890 SEALANT
- 18) PERFORM RESISTANCE CHECK TO ENSURE MAX RESISTANCE IS 10 MILLIOHMS

**RELEASED**  
CP 12.08.17  
ECN 12-631



# DART SERVICE INSTRUCTION

TO AMEND INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D206-667 Rev. 3 OR LATER

REF. CANADIAN STC: SH01-5

REF. FAA STC: SR01304NY

REF. EASA STC: EASA.IM.R.S.01179

## PURPOSE:

The supports on the following crosstubes are now installed using Proseal instead of Magnobond:

D206-667-101 @ CHG 004

D206-667-103 @ CHG 005

D206-667-107 @ CHG 002

D206-667-201 @ CHG 004

D206-667-203 @ CHG 004

D206-667-207 @ CHG 002

D407-667-105 @ CHG 004

## CHANGE:

For the crosstubes listed above, section 32.4 of ICA-D206-667 is amended as follows. Use Figures 32-4 to 32-8 of ICA-D206-667 for further reference. For crosstubes of an earlier change number, it is recommended that if the supports are removed, the supports should be reinstalled using the procedure listed below.

### 32.4 SUPPORT INSTALLATION

- 32.4.1 Locate the area on crosstube for installation of support (ref. Figures 32-4 to 32-8 of ICA-D206-667). For D206-667-101/-103/-107/-201 and D407-667-105 crosstubes, the outward face of the support tabs should be 13.08" (332mm) from the crosstube center. For D206-667-203/-207 crosstubes, the outward face of the support tabs should be 10.03" (255mm) from the crosstube center. Ensure paint finish of crosstube is intact; touch up as required per Chapter 5 (5.3.9) of ICA-D206-667.
- 32.4.2 If present, remove any paint/primer on bottom of supports. Abrade mating surfaces of support and crosstube with 400-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.3 Ensure a layer of 3M Scotch-Weld 2216 B/A Epoxy Adhesive is on the bottom of the support. If required, either apply or touch-up support to have a 0.03" to 0.05" thick layer of adhesive over the entire mating surface. Allow supports to cure for 24 hours.
- 32.4.4 Abrade mating surfaces of support (after cure) and crosstube with 180-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.5 Apply a 0.04" to 0.07" thick layer of Proseal 890 Class B or AMS-S-8802 Class B sealant underneath applicable support and install support.
- 32.4.6 Install the clamps opposite to crosstube support as shown in Figures 32-4 to 32-8 of ICA-D206-667. Install rubber cushions underneath each clamp around the bottom circumference of the crosstube up to the crosstube centerline. Torque clamps 80-100 in·lb (9.0-11.3 Nm). It is acceptable to use smaller or larger sized MS21920-XX clamps than those listed in ICA-D206-667, ensure that after torquing the clamps per this instruction, the nuts are in safety but not bottomed out
- 32.4.7 Prior to installing crosstube on aircraft, allow supports to cure for 72 hours and recheck torque on clamps.

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01





APPROVED

BY:   
D. SHEPHERD (DE # 02)

DATE: 11.07.20

CERT. NO.: SH01-5

ISSUE NO.: 3

A	NEW ISSUE	CP	11.07.15
REV.	DESCRIPTION	BY	DATE
DESIGN		<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN			
CHECKED	ASS	DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9565	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		SUPPORT INSTALLATION CHANGE	NTS
DATE	11.07.15	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

# DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 REV. D AND EARLIER AND  
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D206-667 REV. 3 AND EARLIER

REF: CANADIAN STC: SH01-5

REF: FAA STC: SR01304NY

REF: EASA STC: EASA.IM.R.S.01179

## PURPOSE:

The purpose of this service instruction is to permanently add the D206-667-017 Kit to the DXXX-667-101/-103/-105/-107 Crosstube kits.

## INSTRUCTIONS:

DXXX-667-101/-103/-105/-107 Crosstubes at CHG 005/006/005/003 (respectively) and later are supplied with the D206-667-017 Grounding Strap Kit installed per section 3.2 of IIN-D206-667 Rev. D.

## WEIGHT AND BALANCE




There is a negligible weight change associated with the installation of this kit.

CANADA  
DEPARTMENT OF TRANSPORT  
AIRCRAFT CERTIFICATION  
BRANCH  
DAO # 01-O-01

APPROVED

BY:   
D. SHEPHERD (DE # 02)

DATE: 12.08.02  
CERT. NO.: SH01-5  
ISSUE NO.: 3

A	NEW ISSUE (REF CIR 12-3)	AJS	11.08.02
REV.	DESCRIPTION	BY	DATE
DESIGN	AJS	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9628	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		GROUNDING STRAP INSTALLATION	NTS
DATE	12.08.02	COPYRIGHT © 2012 BY DART AEROSPACE LTD <small>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

## 407-667-105 Folio

### Setup

Use 1.6" spacers under 2.25 rollers

2.935" (2.875 + one .060 shim) for SA,, 2.995 ( 2.875 + two .060 )shims for SB Spacer in buggy on large table/adjust supporting rollers as required.

19.25", **36.4" RED** from cuff, centerline is @ 56.6

### LARGE TABLE

Run programs 407f 01-07 without stopping going down the taper, **36.4" line**, approaches are Y 3200 and W 1750. CHECK

Then run programs 407f 10-16 without stopping from **19.25" line**. "CHECK" approaches are Y 3500 and W 3200 for all programs running up taper, . Programs 17 and up are to finish tube off if necessary. CHECK between each program.. **Large table**

in order to reduce the height, increase cuff angle at program 7. tubes are still finishing too high. jw 11-08-26

- update: increased power on step 9 of prog 7 by 20 points. tubes are finishing at prog 19. height fixed.

12-08-01 after program 7 on both tubes, side "B" had bent in substantially more than side "A". approximately 4" more than the first side. tubes both turned out okay, but were watched closely on the second side.

13-02-14 Bent 2 as per folio.. (1-7 CHECK.. 10-16 CHECK).. ran 17, 18, 19, 20... checking between each, 1st tube finished on 20, 2nd finished on 19..... (run 18a if really close to finished tangent line) MO

1	1
2	2
3	3
4	4
5	5
6	6
7	7
10	10
12	12
14	14
15	15
16	16



7154 1924/5/11/14.6

11



**skyservice**  
Air travel. Evolved.

# NDT Work Order

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 34

WO #: YYZ  
Make: 70295  
TSN:

Customer: DART AEROSPACE  
Model:  
CSN:

Dept: NDTYYZ  
Reg:  
TSO:

Reference: 26038  
A/C S/N:  
Tail#:

Task: ☒ Scheduled ☐ Unscheduled ☐ A.O.G. ☒ P.T. ☐ M.T. ☒ E.T. ☐ U.T. ☐ F

## Work Required:

CARRY OUT NDT ON THE FOLLOWING ITEMS:

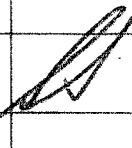
① ITEM ID = D206-667-103 RLC FWD CROSS TUBE

WORK ORDER ID'S - 124882, 124883

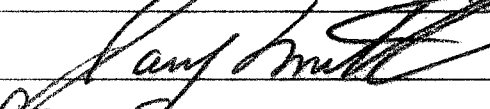

② ITEM ID = D407-667-105 RLC FWD CROSS TUBE

WORK ORDER ID'S - 124886, 124887, 124888

③ ITEM ID = D4806-3 STUD - WORK ORDER ID 121492

Action Taken:	Date:	Initial/Stamp:
LIQUID PENETRANT AND EDDY CURRENT		
INSPECTIONS CARRY OUT WHERE	07 OCT 2014	
APPLICABLE ON ITEMS LISTED ABOVE		
NO CRACKS FOUND		
EDDY CURRENT = NORTEL 500S, S/N T-20656 CAL DUE - 30 JAN /		
PENETRANT = ARDROX 970 P25E	BATCH	823/2131
BLACK LIGHT = T-20990N		

I certified that the maintenance described above has been performed with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: 07 OCT 2014
Name: GARY SMITH		

**RT**  
OSPACE

Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID **PO26038**

Purchase Order Date 10/7/2014

PO Print Date 10/7/2014

Page Number 2 of 3

**Order From :**

VC-SKY001

**Ship To :** DART AEROSPACE LTD

SKYSERVICE  
6120 MIDFIELD ROAD  
MISSISSAUGA, ONTARIO L5P 1B1  
CANADA

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

**Contact Name**

**Vendor Phone** 905-678-5636

**Ship To Contact**

**Ship To Phone**

**Ship Via:** Delivered

**Ship Acct:**

**Buyer**

**Customer POID**

**Customer Tax #** 10127-2607

**Terms** Net 30

**Currency** CAD

**FOB** FCA - (Free Carrier)

3	124883	D206-667-103RLC CROSSTUBE	10/7/2014	1.00	\$0.00	\$0.00
---	--------	------------------------------	-----------	------	--------	--------

Yes  
10/7/2014

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR  
LPI AS PER ASTM 1417 LEVEL 2

**Line Total:** \$0.00

4	124882	D206-667-103RLC CROSSTUBE	10/7/2014	1.00	\$0.00	\$0.00
---	--------	------------------------------	-----------	------	--------	--------

Yes  
10/7/2014

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR  
LPI AS PER ASTM 1417 LEVEL 2

**Line Total:** \$0.00

5	124886	D407-674-105RLC CROSSTUBE	10/7/2014	1.00	\$0.00	\$0.00
---	--------	------------------------------	-----------	------	--------	--------

Yes  
10/7/2014

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR  
LPI AS PER ASTM 1417 LEVEL 2

**Note:**

10/7/2014